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ABSTRACT

This study compared the results of four different methods of observing teacher training. In addition, it used the results to identify those training techniques which seemed to be better at changing teachers' behavior in their classrooms. Twenty-nine teachers were trained by five trainers in five weekly training sessions, which were tape recorded. The recordings were analyzed using these observation methods: (1) Trainer Citation of Observation Variables; (2) Flanders Interaction Analysis; (3) B. O. Smith's Analysis of the Logic of Teaching; and (4) Content Analysis. The dependent variable was based upon pre- and post-training observations of the teachers in their own classrooms. The findings of the four observation methods, while consistent, revealed different facets of the training experience. The most accurate predictor of resulting teacher change was the total number of Trainer Citations of the Observation Variables, but the framework for the model, the structure of the trainer's interactions, relied upon the Flanders Matrix. B. O. Smith's analysis gave a glimpse into the processes that take place between the trainer and teachers, and how a teacher is induced to change. The Content Analysis identified those areas of training that appear to be the most useful to teachers in enabling them to change their teaching behaviors. Fourteen tables are included in the report. (Author/JD)

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DOES TIME-ON-TASK WORK FOR TEACHER TRAINING TOO?

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OVERVIEW

During the fall and winter of 1981-82, twenty-nine junior high teachers in the District of Columbia Public Schools were trained in a program called Academic Learning Time which taught methods for improving student achievement with a focus on the effective use of time in the classroom. The program was based on training designed by Dr. Jane Stallings, entitled, The Process of Teaching Basic Reading Skills in Secondary Schools.

The involved teachers represented various content areas: nine in mathematics, seven in science, six in English, three in history, two in reading, one in industrial arts, and one in French, but the emphasis was on reading skills in those areas. The teachers were personally asked if they would like to participate in training by their principal or regional supervisor. In general, they were selected because of their leadership potential among their peers. Eight teachers were selected from each of the four regions of the school system, and at least two teachers came from any one school. Teachers were given two in-service credits for the training, which took place after school for 2½ hours one day a week for five weeks; they were given no other compensation.

The topics of the five workshops were:

I. Overview of the Research on Teacher Effectiveness

II. Strategies for Teaching Reading

III. Classroom Management

IV. Behavior Management

V. Feedback and Direct Instruction.

The training is designed for one trainer to work with a small group: six to eight teachers. The teachers learn the content of training during

a session, attempt to apply the techniques in their classes during the week, then return to the workshop and freely exchange their experiences. Thus the emphasis is both on (1) content and (2) sharing of experiences.

The training model used in the District of Columbia not only trained the teachers but also trained four supervisors, one from each region, to be trainers. This was accomplished by having a consultant/teacher trainer, who is associated with the Stallings' Teaching and Learning Institute, train a group of teachers on Monday afternoons while the four apprentice trainers observed. The next morning the consultant met with the trainers in effect to train them. That afternoon, Tuesday, each trainer met with the teachers from her region and trained them under the supervision of the consultant.

The training groups were intended to be equal size; however, because of scheduling difficulties, eleven teachers were allowed in the consultant's group, reported in this paper as group 5. The size of the other trainers' groups were: three in group 1, six in group 2, four in group 3, and five in group 4.

Before and after the training each teacher was observed with one class for three different sessions by observers using the Stallings' SRI Secondary Observation Instrument. This observation provides detailed information on teacher interactions every five seconds in the classroom. The information is reported in terms of frequency of occurrence for nineteen variables on the Five Minute Interaction (FMI) report, and in the percentages of time spent on different interactions on the Snapshot report. These pre and post data on the teacher behavior in their classrooms provide the dependent variable for this study. The degree to which teachers alter their teaching from the pre training observation to the post training observation is the measure used to assess the impact of the five different treatments, or training experiences that they receive in their different groups.

Rather than have an observer sit in on each of twenty-five workshops (five workshops over five weeks), it was decided to tape record each session and to use that as the basis for the teacher training observations. A precedent has been established for using transcripts to assess behaviors in work such as that by Smith, Wright, and Flanders (Medley and Mitzel), and a tape recorder is a relatively unobtrusive participant.

None of the established methods for observing teacher behavior was entirely satisfactory, taken by itself. Each provided a different perspective of what was happening in the training. If the theory underlying the method did not measure the aspects of training that in fact were causing the changes in the teachers' behaviors, then the study would reinforce the opinion of just one of the "blind men studying the elephant." It was determined that an eclectic approach for observation would be used with different observation methods. This approach would provide a more complete picture by measuring what actually occurred in different complementary ways. Each method could also serve to validate or refute findings of another method. If similar results came from two different methods, then one could be fairly confident of the findings. Additionally, using different observation methods would provide an indication of which method was most predictive of the changes in teacher behavior.

Four methods of observation were selected: (1) Trainer Citation of Observation Variables, (2) Flanders' Interaction Analysis, (3) B. O. Smith's Analysis of the Logic of Teaching, and (4) Content Analysis.

It would seem that the measure which theoretically would most accurately predict teacher change on any of the thirty-one classroom observation variables would be the amount of emphasis that the trainer put on each of the variables, measured by counting the trainer references to each one. This trainer behavior could be interpreted as "teaching to the test." There is, of course, nothing

wrong with this, especially if it serves to sensitize teachers to which classroom variables have the greatest impact on achievement. The measure of trainer citations should also reflect the trainer's conscious or subconscious concern or sense of importance of that variable. Whether or not this concern transfers to the teachers' behavior is directly measurable.

Flanders in his studies stressed the importance of teacher-student interactions, and this is also stressed in the Stallings training. By measuring the training using Flanders' method, it can be seen whether teachers who are trained with more interactive methods begin to teacher their students with more interactive methods.

B. O. Smith in his study of the logic of teaching was seeking to discover if the type of teacher discourse had an effect on students. In transfering his model to teacher training, it can be seen whether teachers learn and translate to behavior better when questions are directed to them of an evaluative nature, rather than a defining or describing nature, for example. The B. O. Smith analysis may give the best insight into what expectations the trainer has of the teachers within the workshops.

Finally, the content analysis will catalogue what the trainers said to the teachers. Their stress on the various aspects of effective teaching and their adherence to the training program can be used to structure an idealized model for training, much as Dr. Stallings developed an idealized model for teaching.

One interest of this study is to learn whether or not time-on-task is as reasonable an approach to observing teacher training as it is in the classroom. A simple time-on-task observation of the tapes indicates that the trainer and teachers are rarely off-task; of course, it isn't possible to see who might be daydreaming. And total tape time of the workshops isn't a valid measure because for one workshop, the tape was inadvertently not turned on for the

second half of the workshop, and in all workshops the tape recorder was turned off occasionally for reasons of confidentiality, coffee breaks, etc. The verbal behavior of the trainer and teachers can be measured, however, with attention paid to the content of training, to the use of time, and to effective training practices.

CHANGE IN TEACHER CLASSROOM BEHAVIOR

The first step in the analysis was to examine the results of the pre and post training observation scores, shown on table 1. These scores are based upon the frequency of occurrence of each variable during a forty-five minute class period. The first variable, All Academic Statements, is a sum of the next ten variables, excepting Teacher Corrects and Guides.[1] The criterion for the frequency of occurrence is an idealized situation which realistically expects some negative activities, such as behavior statements, to happen in a classroom.

The frequencies reported for the D. C. teachers were adjusted to more closely reflect the total frequency for the criterion (188). This was important for comparison reasons. Just as important, however, it was necessary to balance the totals of the pre and post observations which, prior to adjustment, were 282 for the pre observation, and 194 for the post observation.

The large total in the pre observation seems to indicate a flurry of activity. It may be that the teachers, as yet unfamiliar with the program, were quite anxious and did all things at once during the initial observations. Another possibility for the difference in the pre and post frequencies is that for the pre observations, the observers were newly trained, and also working under a tight schedule for completing the required number of observations. This was not the case, four months later, when the post observations were conducted. One effect of the high pre observation scores was to give the trainers and teachers an inflated view of how they were doing without any training.

Note that the observations for each teacher were conducted by a trained observer as well as by their regional supervisor who may have also been their trainer.

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[1]. This does not hold true for the pre observation scores with which other difficulties were encountered, as reported on this page.

table 1

FREQUENCY OF OBSERVATION OF CLASSROOM INTERACTION VARIABLES[1]

Observation Variables	Criterion	D. C. Teachers Pre-Training	D. C. Teachers Post-Training	Difference
All Academic Statements	80.00	55.32	86.66	31.34**
Teacher Instructs/Explains	25.00	20.02	19.08	-.94
Teacher Asks Direct Questions	8.00	21.35	15.45	-5.91**
Teacher Asks Clarifying Questions	3.00	.78	.72	-.06
Teacher Calls Upon Different Students	6.00	8.71	8.58	-.13
Students Respond	8.00	27.64	18.80	-8.84**
Teacher Praises or Supports	4.00	9.19	8.38	-.81
Teacher Corrects	4.00	3.25	3.59	.34
Teacher Corrects and Guides	2.00	9.25	2.57	-6.68**
Students Read Aloud	12.00	0.98	4.05	3.07*
Teacher Reads Aloud	10.00	.01	.44	.43*
All Organizing or Managing Statements	12.00	11.05	8.10	-2.95**
Teacher Working Alone	5.00	9.87	1.00	-8.87**
Teacher Monitoring Written Work	5.00	7.15	5.25	-1.90
All Behavior Statements	3.00	1.76	1.79	.02
All Social Statements	2.00	.11	.10	-.01
Intrusion	.00	.98	1.16	.17
Positive Interactions	2.00	.53	2.28	1.74**
Negative Interactions	.00	.11	.01	-.10
Total:	188.00	186.99	188.46	

**α = .01
*α = .05

1. The numbers for the pre-training and post-training have been adjusted proportionally to approximate the number of interactions in the criterion (188).

A second format which was part of the classroom observations was the SRI Classroom Snapshot in which the observer scans the room noting what all persons are doing at one point in time. The variables for the snapshot are reported as percentage of occurrence, see table 2.

It can be noted on both tables that the teachers did change their behavior between the pre and post observations. On some of the variables the teachers increased the frequency, (shown as a positive difference) and on others, they decreased the frequency (a negative difference). This could be expected since there is only a set amount of time during a class period, and to increase one variable could diminish another. The question to be examined is whether the change was in the direction taught to them during the training.

What the teachers were instructed to do came from three sources. (See table 3.) It was explained to them which variables were positively and which negatively correlated with achievement. Additionally, based on the pre observation profile, each teacher was told to (1) increase, (2) continue at the current level, or (3) decrease the number of interactions he or she had on each variable. The teachers had the given criterion for each variable and were told to approach it in their teaching. The picture became slightly more confusing for any teachers who had academically high classes, because they needed to follow other recommendations, such as not reducing silent reading. To synthesize the various sources of recommendations, teachers were told to personally try to attain a balance that is correct for themselves in that class in applying the research findings.

A simple count of the direction of the teacher change shows that for the correlation to achievement, teachers increased or decreased interactions in the recommended direction on ten of the thirteen variables. For the

table 2

PERCENTAGES OF OBSERVED TIME ON SNAPSHOT VARIABLES

Observation Variables	Criterion	D. C. Teachers Pre Training	D. C. Teachers Post Training	Difference
Reading Silently	15.00	1.28	1.06	-.22
Reading Aloud	6.00	1.92	5.29	3.37*
Making Assignments	10.00	5.65	6.40	.74
Instruction/Explanation	25.00	26.03	35.19	9.16*
Discussion/Review Assignments	10.00	15.30	17.20	1.90
Practice Drill	4.00	3.40	2.98	-.42
Written Assignments	20.00	19.96	15.92	-4.04
Taking Test/Quiz	5.00	3.34	4.09	.74
Social Interaction	.00	6.18	2.22	-3.96**
Student Uninvolved	.00	7.20	2.53	-4.66*
Being Disciplined	.00	.31	.09	-.22
Classroom Management	5.00	7.50	4.32	-3.18

**α = .01
*α = .05

table 3

INSTRUCTION AND TEACHER BEHAVIOR TO INCREASE OR DECREASE VARIABLES

Observation Variable	Correlation to Achievement (+ positive - negative)	Instructions to Teachers (number) more	current is o.k.	less	To Approach Criterion (+ more - less)	Direction Teacher Change (significant) (+ more, - less)
Five Minute Interactions						
All Academic Statements	+	9	20	0	+	+ **
Teacher Asks Direct Questions	+	0	29	0	-	- **
Students Respond	+	2	27	0	-	- **
Teacher Corrects and Guides	+	2	27	0	-	- **
Students Read Aloud	+	29	0	0	+	+ *
Teacher Reads Aloud	+	28	0	0	+	+ *
All Organizing or Managing Statements	-	0	11	16	non sig.	- **
Teacher Working Alone	-	0	6	23	-	- **
Positive Interactions	+	25	4	0	+	+ **
Snapshot						
Reading Aloud	+	18	4	0	+	+ *
Instruction/Explanation	+	11	11	0	non sig.	+ *
Social Interaction	-	0	5	17	-	- **
Student Uninvolved	-	0	3	19	-	- *

**.\ = .01
*.\ = .05

instructions to teachers, ten of the thirteen variables agreed and the remaining three were given as currently o.k. The direction of teacher change agreed with all twelve of the changes indicated for approaching the criterion. It would appear that teachers did heed their individual instructions as well as begin to approach the criterion in their interactions.

It isn't likely, however, that the teachers sought to reduce certain positive variables such as, Students Respond, for the purpose of replicating the criterion in their own classes. What is more likely is that those interactions were reduced as teachers put more emphasis on other variables. In no case does the teacher's instructions contradict the correlation to achievement. In several cases, however, the criterion contradicts the other two categories.

For the purposes of this study, the direction of the recommended change will be based upon the correlation (positive or negative) with achievement. The quantity and magnitude of these changes in the given positive or negative direction will be used to compare the five training groups using the different observational techniques.

Table 4 shows the significant changes in the number of teacher interactions by their training groups. All five of the groups made significant overall improvement as shown in the number of academic statements made in class. Additionally, the teachers in Group 1 increased Teacher Praises or Supports, and Positive Interactions. It will be interesting to note from the Flanders analysis if their trainer was also high in praising and supporting them.

The distribution of changes for Group 2 on the FMI variables closely resembles the patterns for Groups 4 and 5. Note additionally, that Group 2 teachers were the only ones to significantly alter the Snapshot variables. This could indicate that for the other training groups, the training was

table 4

CHANGES IN TEACHER BEHAVIOR BY TRAINING GROUP

Observation Variable Five Minute Interactions	Group 1 n = 3	Group 2 n = 6	Group 3 n = 4	Group 4 n = 5	Group 5[1] n = 11	All Groups
All Academic Statements	+ **	+ **	+ **	+ **	+ **	+ **
Teacher Asks Direct Questions		- *[2]	- *[2]	- *[2]	- **[2]	- **[2]
Teacher Calls Upon Different Students				+ **		
Students Respond		- **[2]	- **[2]	- **[2]	- **[2]	- **[2]
Teacher Praises or Supports	+ *					
Teacher Corrects and Guides		- **[2]		- **[2]	- *[2]	- *[2]
Students Read Aloud						+ *
Teacher Reads Aloud						+ *
All Organizing or Managing Statements					- **	- **
Teacher Working Alone		- **		- **	- **	- **
Intrusion		+ *[2]				
Positive Interactions	+ *		+ *			
Snapshot						
Reading Aloud						+ *
Making Assignments		- *				
Instruction/Explanation						+ *
Written Assignments		+ *[2]				
Social Interaction		- **				- **
Student Uninvolved		- *				- *

1. Group 5 was trained by the consultant.

2. These changes were not in the direction indicated by the correlation with achievement.

(+ = increase, - = decrease)

**α = .01

*α = .05

a non-adaptational model in that teachers increased or decreased the frequency of certain variables, but did not alter the proportions of time given to different activities. The other groups did make some changes as shown by the significance levels for all groups combined.

The kinds of changes made by Group 2 teachers in the Snapshot variables were to decrease Social Interactions and Students Uninvolved. This may have reflected the increase in Written Assignments, but the students were attending to their writing. Group 2 teachers were also successful in reducing their time spent on Making Assignments.

Group 3, which resembles Group 1 in increasing the Positive Interactions, also significantly reduced the interactions of Teachers Asking Questions and Students Responding, as did Groups 2, 4, and 5. The Flanders and B. O. Smith analyses may shed light on the training experiences of teachers and the question-answer behavior of their trainers.

Group 4, similar to Groups 2 and 5, reduced the Teacher Correcting and Guiding behavior and time spent with Teacher Working Alone. Group 4 teachers were unique in significantly increasing the numbers of different students they called upon. Note that the number of Students Responding declined. This may have been because slower students were now being called upon, and fewer total student answers were possible.

Training for Group 5, conducted by the consultant, operated as a model for the other training groups, which may explain the resemblance of Groups 2 and 4. The consultant, in addition to establishing the model for change, was successful in having teachers reduce their Organizing and Managing Statements.

From the profiles of significant change by group, it is not possible to assert that any one training experience was without question better than another. For this study it would be useful to be able to rank the training groups in order to compare them to the ranks derived from the observational

methods. For that purpose, tables 5, 6 and 7 were developed. Table 5 gives the pre and post observation means on each variable for each group. Table 6 shows the results of analysis of covariance and provides an adjusted post observation mean. The amount of change in the teachers' classroom behaviors on each variable from the pre observation mean to the adjusted post observation mean is divided by the pre observation mean to give a measure of magnitude or percentage of change teachers made in their classrooms. When a correction is made to ensure that teacher changes are in the recommended directions (increase variables positively correlated with achievement, and decrease variables negatively correlated with achievement) as done in table 7, then rankings by group do emerge.

For the FMI variables, given as frequencies, Group 5 had the greatest magnitude of change and was ranked first, Group 3 ranked second, Groups 1 and 2 were very close and ranked third and fourth respectively, and Group 4 ranked fifth. The rankings turned on the variables, Teacher Reads Aloud (TRA) and Positive Interactions (PI). For PI, the changes in Groups 1 and 3 were so great (see table 5) that Group 3 was catapulted to the second rank, and Group 2 was greatly augmented despite the fact that Group 2 had actually declined a small amount (.21 to .18). The problem was caused by using an analysis of covariance with groups of unequal size and widely different pretest to posttest scores.

The results of the analysis of the Snapshot variables,, given as percentages, gives Group 2 the first ranking, followed by Groups 5, 3, and 1 respectively. The fifth ranking of Group 4 remains the same as the FMI ranking. These rankings turn on the variable, Reading Aloud (RA), which places Group 2 in the first rank.

Because of the problem with the widely divergent magnitudes of change caused by the analysis of covariance, the percentages are converted to ranks

table 5

PRE AND POST OBSERVATION SCORES BY GROUP*

Variables with Acronym	Pre Observation Mean					Post Observation Mean				
frequencies	Grp 1	Grp 2	Grp 3	Grp 4	Grp 5	Grp 1	Grp 2	Grp 3	Grp 4	Grp 5
All Academic Statements-AAS	59.23	55.56	56.28	56.91	53.05	92.81	85.02	79.31	87.02	88.38
Teacher Instructs/Explains-TIE	24.19	11.92	17.73	27.27	20.83	23.23	9.58	17.90	20.63	22.86
Teacher Asks Direct Questions-TADQ	27.54	22.80	27.30	16.88	18.75	18.13	19.31	15.62	12.66	14.54
Teacher Asks Clarifying Questions-TACQ	1.22	0.82	0.00	1.09	0.78	1.97	0.60	0.68	0.48	0.58
T. Calls Upon Different Students-TCUDS	12.30	13.74	6.14	7.24	6.58	9.61	11.08	6.82	8.98	7.39
Students Respond-SR	33.80	31.28	29.93	21.85	25.76	24.48	23.18	14.47	15.79	17.80
Teacher Praises or Supports-TPOS	6.81	11.34	9.10	10.37	8.16	11.32	9.79	6.63	7.70	7.75
Teacher Corrects-TC	2.11	5.24	3.85	2.92	2.41	3.26	5.39	1.98	2.21	3.91
Teacher Corrects and Guides-TCAG	5.57	13.57	10.60	9.83	7.15	3.06	3.06	1.50	1.66	2.96
Students Read Aloud-SRA	0.24	2.02	1.75	0.00	0.77	0.13	4.08	4.14	9.43	2.63
Teacher Reads Aloud-TRA	0.00	0.04	0.00	0.00	0.01	0.00	0.84	0.07	1.06	0.18
All Organizing/Managing Statements-AOOMS	-7.99	-11.42	-9.05	-9.67	-13.03	-3.13	-9.89	-12.94	-7.24	-7.12
Teacher Working Alone-TWA	-7.75	-8.32	-6.34	-6.22	-14.24	0.00	-0.31	-1.69	-0.62	-1.57
Teacher Monitoring Written Work-TMWW	-7.19	-6.51	-7.76	-2.96	-9.17	-2.19	-3.48	-9.75	-3.64	-6.15
All Behavior Statements-ABS	-1.02	-2.30	-2.50	-1.15	-1.68	-0.39	-1.97	-4.31	-2.25	-0.94
All Social Statements-ASS	-0.09	-0.12	0.00	-0.05	-0.18	-0.16	-0.10	0.00	-0.10	-0.12
Intrusion-I	-1.49	-0.80	-0.45	-1.61	-0.86	-0.35	-1.50	-0.48	-2.25	-0.95
Positive Interactions-PI	1.29	0.21	0.17	0.59	0.62	8.26	0.18	1.60	1.47	2.40
Negative Interactions-NI	-0.07	-0.09	-0.52	0.00	-0.04	0.00	-0.03	0.00	0.00	0.00
percentages										
Reading Silently-RS	-1.77	-0.65	-4.15	0.00	-1.04	0.00	-0.37	0.00	-5.42	-0.14
Reading Aloud-RA	0.23	0.50	5.50	1.24	2.16	4.87	5.50	4.78	4.52	5.82
Making Assignments-MA	-7.87	-5.53	-5.63	0.00	-7.69	-6.33	-1.17	-13.53	-4.84	-7.38
Instruction/Explanation-I/E	33.93	19.92	17.65	30.40	28.27	44.23	33.93	33.38	35.46	33.94
Discussion/Review Assignments-DRA	12.57	10.50	25.25	26.96	19.75	12.97	12.83	27.25	19.12	16.22
Practice Drill-PD	13.63	0.37	1.75	0.00	4.41	8.80	0.05	0.00	1.48	4.75
Written Assignments-WA	-11.93	-12.75	-14.98	-25.94	-25.18	-9.80	-22.12	-15.85	-11.94	-16.04
Taking Test/Quiz-TTQ	3.20	3.93	6.85	0.00	3.30	4.10	5.12	0.00	1.56	6.15
Social Interaction-SI	-2.67	-10.20	-8.88	-4.54	-4.71	0.00	-1.88	-3.63	-2.02	-2.58
Student Uninvolved-SU	-3.10	-22.23	-4.75	-1.56	-3.56	-0.13	-3.95	-1.35	-4.20	-2.09
Being Disciplined-BD	0.00	-0.67	-0.78	0.00	-0.18	0.00	0.00	0.00	-0.10	-0.19
Classroom Management-CM	-2.07	-10.55	-1.78	-8.10	-9.14	-4.40	-7.62	0.00	-5.86	-3.37

* Variables which were to be decreased were entered as negative numbers. If the teachers responded appropriately then there would be fewer interactions and the post observation would be the higher number for negative variables.

table 6

ADJUSTED POST OBSERVATION SCORE AND MAGNITUDE OF CHANGE BY GROUP

Variables by Acronym frequencies	Covariant Effect (d.f.=1,23)	Main Effect (d.f.=4,23)	Adjusted Post Observation Mean (covaried) Grp 1	Grp 2	Grp 3	Grp 4	Grp 5	Percentage of Change $\left(\frac{\text{adj.-pre}}{\text{pre}}\right)$ Grp 1	Grp 2	Grp 3	Grp 4	Grp 5	Correlati with Ach. +pos.	-ne
AAS	4.177	4.221	91.48	84.94	78.99	86.48	89.15	54.4%	52.9%	40.4%	52.0%	68.0%	+	
TIE	4.702	1.471	22.44	11.10	18.33	19.27	22.70	-7.2	-6.9	3.4	-29.3	9.0	+	
TADQ	12.325	3.044	15.63	18.72	11.22	14.47	15.60	-43.2	-17.9	-58.9	-14.3	-16.8	+	
TACQ	5.123	3.181	1.86	0.58	0.86	0.40	0.58	52.5	-29.3	0.0	-63.3	-25.6	+	
TCUDS	8.497	0.739	8.97	10.17	7.29	9.24	7.77	-27.1	-26.0	18.7	27.6	18.1	+	
SR	14.384	3.367	22.60	22.06	13.77	17.57	18.38	-33.1	-29.5	-54.0	-19.6	-28.6	+	
TPOS	5.227	1.990	12.00	9.18	6.65	7.37	8.05	76.2	-19.0	-26.9	-28.9	-1.3	+	
TC	3.083	2.133	3.56	4.86	1.83	2.30	4.13	68.7	-7.3	-52.5	-21.2	71.4	+	
TCAG	0.377	0.837	2.93	3.23	1.55	1.69	2.89	-47.4	-76.2	-85.4	-82.8	-59.6	+	
SRA	0.051	1.695	0.43	3.65	3.82	9.83	2.71	79.2	80.7	118.3	0.0	251.9	+	
TRA	4.119	1.252	0.09	0.58	0.17	1.16	0.23	0.0	13.5	0.0	0.0	2200.0	+	
AOOMS	5.139	6.691	-3.88	-9.79	-13.43	-7.58	-6.62	-51.4	-14.3	48.4	-21.6	-49.2	-	
TWA	36.610	1.779	-0.48	-0.66	-2.49	-1.45	-0.58	-93.8	-92.1	-60.7	-76.7	-95.9	-	
TMWW	6.779	1.333	-2.18	-3.69	-9.55	-5.03	-5.47	-69.7	-43.3	23.1	69.9	-40.3	-	
ABS	30.738	1.631	-1.47	-1.19	-3.24	-3.14	-1.06	44.1	-48.3	29.6	173.0	-36.9	-	
ASS	0.346	0.944	-0.16	-0.10	0.01	-0.09	-0.13	77.8	-16.7	0.0	80.0	-27.8	-	
I	3.940	1.914	-0.13	-1.58	-0.72	-1.96	-1.00	-91.3	97.5	60.0	21.7	16.3	-	
PI	66.610	3.671	5.61	1.32	2.90	1.30	2.12	334.9	528.6	1605.9	120.3	241.9	+	
NI	0.014	0.910	0.00	-0.04	0.00	0.00	0.00	-1.0	-55.6	-1.0	0.0	-1.0	-	
percentages														
RS	0.278	2.001	0.01	-0.38	0.06	-5.44	-0.14	-100.6	-41.5	-101.4	0.0	-86.5	-	
RA	0.944	0.066	4.35	5.06	5.89	4.31	5.90	17.9	912.0	7.1	247.6	173.1	+	
MA	2.811	2.136	-5.68	-1.21	-13.54	-6.53	-6.78	-27.8	-78.1	140.5	0.0	-11.8	-	
I/E	0.494	0.261	43.48	34.52	34.18	35.04	33.72	28.1	73.3	93.7	15.3	19.3	+	
DRA	0.322	0.877	12.78	12.51	27.91	19.89	15.84	1.7	19.1	10.5	-26.2	62.5	+	
PD	1.130	0.722	9.53	-0.16	-0.11	1.24	4.82	-30.1	-143.2	-106.3	0.0	9.3	+	
WA	3.378	1.067	-12.64	-24.67	-17.62	-9.83	-14.19	6.0	93.5	17.6	-62.1	-43.6	-	
TTQ	0.528	0.542	4.07	5.25	0.76	0.84	6.15	27.2	33.6	-88.9	0.0	86.4	+	
SI	8.067	0.686	-1.07	-0.66	-2.81	-2.52	-3.03	-59.9	-93.5	-68.4	-44.5	-35.7	-	
SU	4.716	1.067	-1.01	-0.71	-1.87	-5.41	-2.87	-67.4	-86.8	-60.6	246.8	-19.4	-	
BD	0.076	0.090	0.01	-0.01	-0.01	-0.09	-0.19	0.0	-98.5	-98.7	0.0	5.6	-	
CM	0.019	1.314	-3.79	-7.96	0.64	-5.93	-3.55	83.1	-24.5	-136.0	-26.8	-61.2	-	

table 7

MAGNITUDE OF CHANGE IN CORRECT DIRECTION BY GROUP*

Frequency (FMI) Variable	Grp 1	Grp 2	Grp 3	Grp 4	Grp 5
AAS	54.4%	52.9%	40.4%	52.0%	68.0%
TIE	-7.2	-6.9	3.4	-29.3	9.0
TADQ	-43.2	-17.9	-58.9	-14.3	-16.8
TACQ	52.5	-29.3	0.0	-63.3	-25.6
TCUDS	-27.1	-26.0	18.7	27.6	18.1
SR	-33.1	-29.5	-54.0	-19.6	-28.6
TPOS	76.2	-19.0	-26.9	-28.9	-1.3
TC	68.7	-7.3	-52.5	-21.2	71.4
TCAG	-47.4	-76.2	-85.4	-82.8	-59.6
SRA	79.2	80.7	118.3	0.0	251.9
TRA	0.0	13.5	0.0	0.0	2200.0
AOOMS	51.4	14.3	48.4	21.6	49.2
TWA	93.8	92.1	60.7	76.7	95.9
TMWW	69.7	43.3	-23.1	-69.9	40.3
ABS	-44.1	48.3	-29.6	-173.0	36.9
ASS	-77.8	16.7	0.0	-80.0	27.8
I	91.3	-97.5	-60.0	-21.7	-16.3
PI	334.9	528.6	1605.9	120.3	241.9
NI	1.0	55.6	1.0	0.0	1.0
Total	693.2	636.4	1409.6	-305.8	2963.2
Average	36.48	33.49	74.19	-16.09	155.96
(percentage of change) Rank	3	4	2	5	1
(1 = highest)					

Percentage (Snapshot) Variable	Grp 1	Grp 2	Grp 3	Grp 4	Grp 5
RS	100.6%	41.5%	101.4%	0.0%	86.5%
RA	17.9	912.0	7.1	247.6	173.1
MA	27.8	78.1	140.5	0.0	11.8
I/E	28.1	73.3	93.7	15.3	19.3
DRA	1.7	19.1	10.5	-26.2	62.5
PD	-30.1	-143.2	-106.3	0.0	9.3
WA	-6.0	-93.5	-17.6	62.1	43.6
TTQ	27.2	33.6	-88.9	0.0	86.4
SI	59.9	93.5	68.4	44.5	35.7
SU	67.4	96.8	60.6	-246.8	19.4
BD	0.0	98.5	98.7	0.0	-5.6
CM	-83.1	24.5	136.0	26.8	61.2
Total	211.4	1234.2	504.1	123.3	603.2
Average	17.62	102.85	42.01	10.28	50.27
(percentage of change) Rank	4	1	3	5	2
(1 = highest)					
Average of the two ranks:	3.5	2.5	2.5	5.0	1.5

* If the teachers increased or decreased as directed by the correlation with achievement (table 6), it is listed as a positive change (+). If the teachers increased or decreased opposite the direction recommended by the correlation with achivement, it is listed as a negative change.

as shown in table 8. From this a stabilized picture emerges, and the average of the FHI and Snapshot ranks confirms the average of the two ranks given in table 7. For this study, then, the average rank from table 8 will be the ranking of reference.

For future studies, two avenues for ranking training groups based on outcome variables such as these might be recommended: One is to increase the alpha level to $\alpha = .10$. This would be sensitive to more of the smaller changes made by teachers. The other is to use a criterion referenced measure of change which would not be influenced by different group sizes, starting points or opportunities to change. If the study has variables more equivalent in variance and groups of more equal size, an analysis as done here should be satisfactory.

table 8

RANKING OF THE MAGNITUDE OF CHANGE BY GROUP

Frequency (FMI)

Variable	Grp 1	Grp 2	Grp 3	Grp 4	Grp 5
AAS	2	3	5	4	1
TIE	4	3	2	5	1
TADQ	4	3	5	1	2
TACQ	1	4	2	5	3
TCUDS	5	4	2	1	3
SR	4	3	5	1	2
TPOS	1	3	4	5	2
TC	2	3	5	4	1
TCAG	1	3	5	4	2
SRA	4	3	2	5	1
TRA	4	2	4	4	1
AOOMS	1	4	5	3	2
TWA	2	3	5	4	1
TMWW	1	2	4	5	3
ABS	4	1	3	5	2
ASS	4	2	3	5	1
I	1	5	4	3	2
PI	3	2	1	5	4
NI	3	1	3	5	3
Total:	51	54	69	74	37
Average Rank:	2	3	4	5	1

Percentage (Snapshot)

Variable	Grp 1	Grp 2	Grp 3	Grp 4	Grp 5
RS	2	4	1	5	3
RA	4	1	5	2	3
MA	3	2	1	5	4
I/E	3	2	1	5	4
DRA	4	2	3	5	1
PD	3	5	4	2	1
WA	3	5	4	1	2
TTQ	3	2	5	4	1
SI	3	1	2	4	5
SU	2	1	3	5	4
BD	3.5	2	1	3.5	5
CM	5	4	1	3	2
Total:	38.5	31	31	44.5	35
Average Rank:	4	1.5	1.5	5	3

Average of the two ranks:*

	3.00	2.25	2.75	5.00	2.00

*1 = highest, 5 = lowest.

TRAINER CITATION OF OBSERVATION VARIABLES

It is reasonable to consider that teachers would change their behaviors not necessarily because of the manner in which they were trained nor because of the style of their trainer, but simply because they were told to do so. The more frequently the trainer mentioned or cited a particular variable, the more likely that the teacher would be aware of that interaction at the time of the post observations. This could be because the teacher had been conditioned to think about the variables or because the teacher, by virtue of the number of citations, knew that that variable was important to the trainer and strived to please her. In either case, it could be expected that there would be a high correlation between the number of times a trainer mentioned a specific observation variable, and the magnitude of change in that variable effected by teachers in their classrooms.

For this analysis the two observers tallied each time the trainer made a specific reference to an observation variable, as shown in table 9. The tally was not to be made for general discussion of the variable, only the use of the same words as stated in the variable. There was some latitude in this criterion, allowing, for example, a tally for the variable, Teacher Praises or Supports, when the trainer simply said, "praise." But an example such as, "intercom," was not allowable for a tally under the variable, Intrusion. Obviously, the problem was one of defining legitimate tallies. The key to the decision was whether or not the trainer seemed to be citing a specific behavior which would be measured on the post observation.

The interrater correlation on a one hour observation of the tape was $r = .97$ for 28 of the 29 variables. On that observation, however, one observer failed to tally references to the variable, Intrusion. For all 29 variables, the interrater correlation was $r = .69$. The observer had picked up Intrusion prior to and after the correlated sample. Several different

table 9

TRAINER CITATION OF OBSERVATION VARIABLES

Variables	Acronym	Grp1	Grp2	Grp3	Grp4	Grp5
INSTRUCTION						
1. All Academic Statements	AAS	5	19	4	5	14
2. Teacher Instructs/Explains; Instruction/ Explanation (interactive instruction, direct instruction)	TIE I/E	34	70	22	40	41
3. Teacher Asks Direct Questions	TADQ	8	19	17	7	5
4. Teacher Asks Clarifying Questions	TACQ	7	24	24	6	4
5. Teacher Calls Upon Different Students	TCUDS	3	4	2	2	8
6. Student Responds	SR	8	9	6	6	2
7. Reading Silently	RS	7	16	10	7	9
8. Students Read Aloud (reading aloud)	SRA	30	28	19	24	32
9. Teacher Reads Aloud (reading aloud)	TRA	22	26	13	25	29
10 Reading Aloud (mean of 8 & 9 above)	RA	26	27	15	24	30
10. Making Assignments	MA	9	19	9	9	9
11. Practice Drill	PD	8	12	6	1	12
12. Written Assignments	WA	9	21	14	5	13
13. Test Taking/Quiz	TTQ	9	19	14	15	16
CORRECTIVE FEEDBACK						
14. Teacher Praises or Supports (praise)	TPOS	33	36	28	16	20
15. Teacher Corrects	TC	11	11	10	9	6
16. Teacher Corrects and Guides (probing and guiding)	TCAG	19	19	17	19	6
17. Discussion/Review Assignments	DRA	3	13	6	8	6
CLASSROOM MANAGEMENT						
18. All Organizing or Managing Statements	AOOMS	37	33	20	19	26
19. Teacher Working Alone	TWA	13	8	2	4	5
20. Teacher Monitoring Written Work (monitoring)	TMWW	7	12	5	6	10
21. Intrusion	I	16	12	6	9	4
22. Positive Interactions (interactions)	PI	19	28	9	23	10
23. Negative Interactions	NI	2	11	4	7	2
24. Student Uninvolved	SU	1	5	5	1	0
25. Classroom Management	CM	14	16	16	6	21
BEHAVIOR MANAGEMENT						
26. Behavior Statements	ABS	12	26	13	10	12
27. Social Statements	ASS	4	8	6	5	1
28. Social Interaction (socializing)	SI	7	8	6	8	9
29. Being Disciplined (disciplining)	BD	2	2	4	7	3
Total:		359	534	317	309	335*

*For one half of one workshop for Group 5 the tape recorder was accidentally not recording. The total number of references would more accurately approximate 369.

explanations are plausible, but the point is that the observers should be trained or conditioned not to fail to recognize any observation variable.

Given the high interrater reliability on most of the variables, the results are probably fairly accurate. Other spot checks on the tallies by the researcher indicated accuracy. The two observers each listened to different halves of each trainer's workshops, and these were alternated so the observer tallies are evenly applied to each trainer.

An examination of total number of references to the observation variables by the trainers (see table 10) provides no consistent ranking with the ranking of teachers' change in their classrooms, except for Group 4 which was last in both. Group 2 had the greatest number of trainer citations, and was the only group with significant Snapshot changes (table 4). Note on the last workshop, Group 2 mentioned 19 different variables, more than all the others, and made repeated references, totaling 96 over all the variables. Looking at this table alone, it would appear that the strongest training programs may be those which have an academic approach with an emphasis on the behaviors to be changed. However, a Tukey test from a one-way ANOVA of trainer citation

table 10*

Rank	Group		Workshop I	II	III	IV	V	Total
4	1	No.	23	22	17	21	15	-
		Sum	70	92	71	73	53	359
2	2	No.	26	27	24	10	19	-
		Sum	113	118	172	35	96	534
3	3	No.	24	21	21	15	14	-
		Sum	119	38	71	45	44	317
5	4	No.	26	23	20	14	7	-
		Sum	96	90	42	63	18	309
1	5!	No.	20	26	9(18)	18	11	-
		Sum	88	125	34(68)	57	31	335(369)

*Rank is based upon table 8, the average magnitude of change.
Number is the number of different variables mentioned.
Sum is the total number of citations for all variables.
!Figures for Group 5 are adjusted for the missing tape for half of the third workshop.

combined with magnitude of change by group, showed no significant difference between the training groups.

In looking for a relationship between the ranking of the magnitude of change by group (table 8) and the ranking of the trainer citation (table 9) over each variable, only two variables had duplicate rankings: Teacher Reads Aloud (TRA) and All Behavior Statements (ABS). This question of whether or not the number of times a variable was mentioned in training had an influence on how much the teachers changed that variable is examined by a two-way ANOVA which showed significant main effects between trainer citation and teacher change, (d.f = 1,248; F = 4.467; p. = .036). This significant difference means that the training experience did not translate into classroom behavior. On table 11, which gives the means for the five groups combined, and graph 1, which illustrates the same for trainer citation by teacher change on each variable, no significant correlation is in evidence.

The ANOVA test found that there was a significant interaction between the variables and whether they were from the training or classroom situation, (d.f. = 30,248; F=1.794; p. = .009). This significant interaction, however, is a result of the large increases in some variables and decreases in others.

Other significant main effects were found between the variables, (d.f. = 30,248; F = 1.926; p. = .004). The variables each acted differently as can be seen in table 11. The variables on which teachers reduced their behavior generally fall at the top of the list, and those variables on which the teachers made the largest improvements are shown at the bottom. A Tukey test found that the only variable which operated significantly differently from the others was Positive Interactions (PI) at the bottom of the list. It was significantly different from the top sixteen variables on the list. On the graph those are the variables which form a circle cluster in the bot-

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table 11

AVERAGE TRAINER CITATION AND TEACHER CHANGE ON EACH VARIABLE

Variables	Average Trainer Citation	Average Teacher Change	Combined Average
Teacher Corrects and Guides (TCAG)	16.0	-70.28	-27.14
Practice Drill (PD)	7.8	-54.06	-23.13
Teacher Asks Direct Questions (TADQ)	11.2	-30.22	-9.51
All Social Statements (ASS)	4.8	-22.66	-8.93
All Behavior Statements (ABS)	14.6	-32.30	-8.85
Students Respond (SR)	6.2	-32.96	-13.38
Intrusions (I)	9.4	-20.84	-5.72
Teacher Asks Clarifying Questions (TACQ)	13.0	-13.14	-.07
Student Uninvolved (SU)	2.4	-.52	.94
Teacher Calls Upon Different Students (TCUDS)	3.8	2.26	3.03
Written Assignments (WA)	12.4	-2.28	5.06
Negative Interactions (NI)	5.2	11.72	8.46
Teacher Monitors Written Work (TMWW)	8.0	12.06	10.03
Discuss/Review Assignments (DRA)	7.2	13.52	10.36
Teacher Corrects (TC)	9.4	11.82	10.61
Test Taking/Quiz (TTQ)	14.6	11.66	13.13
Teacher Praises or Supports (TPOS)	26.6	.02	13.31
Teacher Instructs/Explains (TIE)	41.4	-6.22	17.60
Being Disciplined (BD)	3.6	38.32	20.96
All Organizing or Managing Statements (AOOMS)	27.0	17.62	22.31
Classroom Management (CM)	14.6	33.08	23.84
Making Assignments (MA)	11.0	51.64	31.32
All Academic Statements (AAS)	9.4	53.54	31.47
Social Interaction (SI)	7.6	60.40	34.00
Reading Silently (RS)	9.8	66.00	37.90
Instruction/Explanation (I/E)	41.4	45.94	43.67
Teacher Working Alone (TWA)	6.4	83.80	45.12
Student Reads Aloud (SRA)	26.6	106.02	66.31
Reading Aloud (RA)	24.4	271.54	147.97
Teacher Reads Aloud (TRA)	23.0	442.70	232.85
Positive Interactions (PI)	17.8	566.32	292.06
		Grand Mean:	33.08
		S.D.:	69.453

tom left-hand portion of the graph. One important indication of table 11 is that the act of teaching is an integrated set of behaviors, and to modify any one member of that set will effect the other members. To increase some variables will decrease others.

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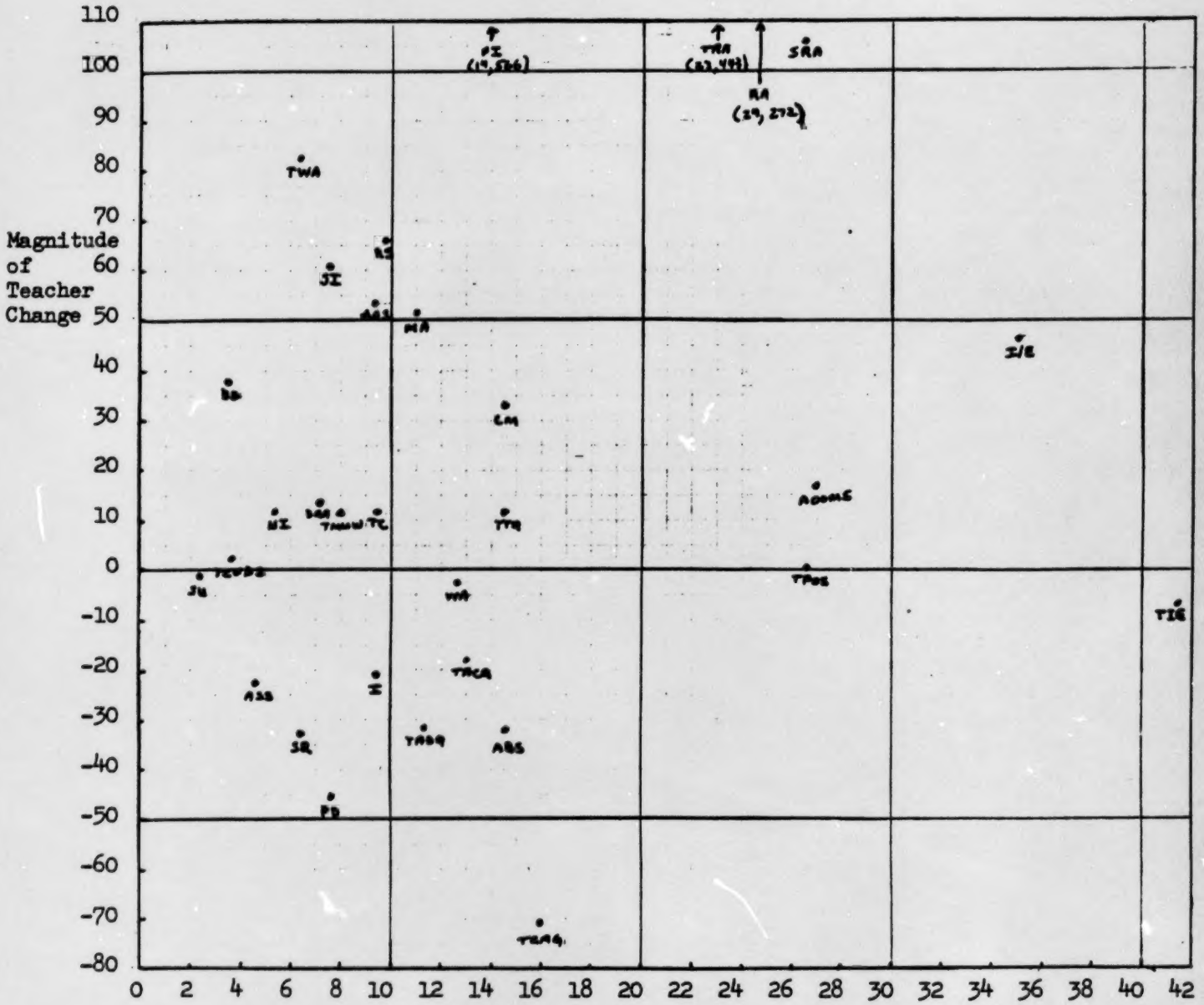
graph 1

SCATTERGRAM OF VARIABLES BY TEACHER CHANGE AND TRAINER CITATION



FLANDERS INTERACTION ANALYSIS

The measurement and analysis of teacher-student classroom interactions designed by Flanders has been submitted as a major tool by which teachers can examine and understand their own behaviors, and if desired, modify their behaviors accordingly. The Flanders system provides a measure of such facets as direct vs. indirect instruction, teacher vs. student talk, interaction vs. monologue, and student-initiated discussion vs. student response. In addition, specific teacher behaviors such as praising, questioning, lecturing and reprimanding are measured.

This tool, applied to a situation of a trainer instructing teachers should be most useful for trainers since they are in the profession of knowing how to best instruct others. In this study, the Flanders analysis should help portray what types of trainer-teacher interactions provide the best model for encouraging teacher change. In addition, insights may be gained into the types of changes made by teachers in the different training groups.

The Flanders analysis was conducted by two observers who learned the technique with the help of a programmed instruction book by William J. Kryspin and John F. Feldhusen entitled, Analyzing Verbal Classroom Interactions. After reading the book the observers held two practice sessions of about 2½ hours each, at the end of which their interrater correlation using all ten categories was r = .82.

The design called for each observer to take a 10% sample of the workshop tapes. This consisted of one minute of observation for each ten minutes of training time. The start points for the one minute were determined randomly from the first ten minutes and assigned using the built-in counter in each tape recorder.

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The counter is calibrated to the revolutions of one spindle of the tapes. Of course, when the tape is quite thick on that spindle, the revolutions are much slower than when the tape is almost completed. For that reason, the first tape recorder was hand tabulated, noting the counter number at the end of each ten minutes of tape time. The second tape recorder had a different count frequency, and these were matched at the beginning and middle of the tape with the first recorder with several trials and averaged about 3.6 counts to the first recorder's one count. The second observer was instructed to multiply the count of his start points by 3.6. When the observations were completed, it was obvious that the adjustment had not been accurate since the second observer recorded only three observations for every five of the first observer. This resulted in a sample of about 16% of the time.

During the minute's observation the observers recorded one communication or statement every three seconds, making twenty statements per observation minute. Using Flanders' method of analysis (see charts 1-5), each statement is paired with the statement following it. The first statement is recorded by row and the successive statement in the appropriate column of that row. With the sampling the last statement does not have a succeeding statement. On the chart, those are recorded as identical pairs (1-1, 8-8, ...) as that tally was desirable for the most complete row totals. In the analysis of interaction vs. identical pairs, the last statements have been deleted from the totals.

In looking for the relationships mentioned earlier between trainer behavior and teacher classroom behavior on praising and question/answer duads, some interesting findings come from the Flanders analysis. For praising the percentages for each group were: Group 1 - 1%; Group 2 - 3.6%; Group 3 - 0.9%; Group 4 - 1.6% and Group 5 - 0.2%. The outstanding trainer

chart 1

Flanders' Interaction Analysis: Group 1*

Statement		Successive Statement 1	2	3	4	5	6	7	8	9	10	Total
Accepts feeling	1	0.2		0.1	0.1				0.1	0.1	0.1	0.7
Praises or encourages	2			0.1	0.1	0.2				0.7	0.1	1.1
Accepts or uses student ideas	3	0.1		1.0	0.1	0.1				0.3	0.1	1.8
Asks questions	4				3.6	0.8	0.1		2.0	0.8	0.7	8.0
Explaining or informing	5		0.3		1.4	26.6	0.1		0.1	2.9	0.9	32.5
Gives directions	6				0.1	0.1	0.2			0.1		0.5
Scolding/reprimanding or defending authority	7											0.0
Student talk: expected or predictable response	8	0.2		0.1	0.3	0.3	0.1		2.4	1.5	0.2	5.0
Student talk: initiated response	9	0.1	1.1	0.5	1.6	2.4				38.0	0.9	44.7
No talk/all talk, transition between students	10			0.1	0.5	1.1			0.6	1.4	2.1	5.7

% Trainer Talk (rows 1-7) 44.5%
% Teacher Talk (rows 8-9) 49.7%
% No Talk/All talk (row 10) 5.7%

% Indirect Training (rows 1-4) 25.9%
% Direct Training (rows 5-7) 74.1%

% Interaction 26.9%
% Identical Pairs 73.1%

*Figures are reported in percentages. n = 1480

chart 2

Flanders' Interaction Analysis: Group 2*

Statement		Successive Statement 1	2	3	4	5	6	7	8	9	10	Total
1. Accepts feeling	1	0.1	0.1	0.1								0.2
2. Praises or encourages	2	0.1	0.8	0.1	0.3	0.8	0.1		0.1	1.1	0.3	3.6
3. Accepts or uses student ideas	3			0.8		0.2				0.1	0.1	1.1
4. Asks questions	4	0.1			1.0	0.3			1.3	0.2	0.6	3.6
5. Explaining or informing	5		0.4	0.1	1.5	46.1	0.6		0.2	2.5	2.6	54.0
6. Gives directions	6					0.6	0.7			0.1	0.1	1.5
7. Scolding/reprimanding or defending authority	7											0.0
8. Student talk: expected or predictable response	8	0.1	0.3		0.2	0.1	0.1		0.8	1.2	0.1	2.8
9. Student talk: initiated response	9		1.8	0.2	0.4	2.6				18.9	1.3	25.3
10. No talk/all talk, transition between students	10		0.4		0.3	2.2	0.1		0.4	1.5	3.0	8.0

% Trainer Talk (rows 1-7) 64.0%
% Teacher Talk (rows 8-9) 28.0%
% No Talk/All Talk (row 10) 8.0%

% Indirect Training (rows 1-4) 13.3%
% Direct Training (rows 5-7) 86.7%

% Interaction 29.0%
% Identical Pairs 71.0%

*Figures are reported in percentages. n = 1708

chart 3

Flanders' Interaction Analysis: Group 3*

Statement		Successive Statement 1	2	3	4	5	6	7	8	9	10	Total
1. Accepts feeling	1	0.1		0.1	0.1	0.1				0.1		0.4
2. Praises or encourages	2			0.1	0.1					0.4	0.1	0.9
3. Accepts or uses student ideas	3			0.5	0.1					0.1	0.2	0.9
4. Asks questions	4		0.1		2.0	0.6			1.0	0.1	0.4	4.1
5. Explaining or informing	5		0.1		1.0	40.0	0.2		0.1	1.3	1.9	44.6
6. Gives directions	6					0.1	0.5					0.6
7. Scolding/reprimanding or defending authority	7											0.0
8. Student talk: expected or predictable response	8		0.1		0.2	0.2			1.7	0.5	0.3	2.9
9. Student talk: initiated response	9	0.1	0.6	0.3	0.6	1.7	0.1			26.6	2.0	31.8
10. No talk/all talk, transition between students	10	0.2		0.1	0.3	1.8	0.4		0.4	2.1	8.8	14.0

% Trainer Talk (rows 1-7) 51.3%
% Teacher Talk (rows 8-9) 34.7%
% No Talk/All Talk (row 10) 14.0%

% Indirect Training (rows 1-4) 12.2%
% Direct Training (rows 5-7) 87.8%

% Interaction 20.7%
% Identical Pairs 79.3%

*Figures are reported in percentages. n = 1521

chart 4

Flanders' Interaction Analysis: Group 4*

Statement		Successive Statement 1	2	3	4	5	6	7	8	9	10	Total
1. Accepts feeling	1	0.1		0.1	0.1							0.2
2. Praises or encourages	2		0.5	0.1	0.1	0.5				0.3	0.2	1.6
3. Accepts or uses student ideas	3		0.1	1.1	0.1	0.2				0.2	0.1	1.6
4. Asks questions	4				1.7	0.2			1.6	0.1	1.2	4.8
5. Explaining or informing	5		0.2	0.1	1.3	37.4	0.2		0.2	1.7	2.0	43.0
6. Gives directions	6					0.2	0.2					0.3
7. Scolding/reprimanding or defending authority	7											0.0
8. Student talk: expected or predictable response	8		0.1	0.1	0.1	0.3			2.8	1.2	0.1	4.4
9. Student talk: initiated response	9	0.1	0.9	0.4	0.6	1.5	0.1			32.6	1.2	36.7
10. No talk/all talk, transition between students	10	0.1	0.2		0.5	1.6			0.5	2.0	2.3	7.2

% Trainer Talk (rows 1-7)	51.6%	% Indirect Training (rows 1-4)	16.0%
% Teacher Talk (rows 8-9)	41.2%	% Direct Training (rows 5-7)	84.0%
% No talk/All Talk (row 10)	7.2%		
		% Interaction	21.7%
		% Identical Pairs	78.3%

*Figures are reported in percentages. n = 1236

chart 5

Flanders' Interaction Analysis: Group 5*

Statement		Successive Statement 1	2	3	4	5	6	7	8	9	10	Total
1. Accepts feeling	1					0.1						0.1
2. Praises or encourages	2		0.3			0.1				0.5	0.1	0.9
3. Accepts or uses student ideas	3									0.2		0.2
4. Asks questions	4		0.1		0.9	0.1		0.1	1.6	0.3	0.6	3.6
5. Explaining or informing	5				0.6	22.9	0.1			1.3	1.1	26.0
6. Gives directions	6					0.1	0.4				0.2	0.8
7. Scolding/reprimanding or defending authority	7							0.1	0.1			0.1
8. Student talk: expected or predictable response	8		0.2	0.1	0.3	0.3			2.6	1.0	0.3	4.8
9. Student talk: initiated response	9	0.1	0.6	0.1	1.3	1.1			0.1	44.7	2.7	50.6
10. No talk/all talk, transition between students	10				0.4	1.7			0.3	2.9	7.5	12.9

% Trainer Talk (rows 1-7)	31.7%	% Indirect Training (rows 1-4)	15.2%
% Teacher Talk (rows 8-9)	55.4%	% Direct Training (rows 5-7)	84.8%
% No Talk/All Talk (row 10)	12.9%		
		% Interaction	21.3%
		% Identical Pairs	78.7%

*Figures are reported in percentages. n = 1598

for praising was Group 2, which did not have the first ranking, but did have the significant changes in the classroom Snapshot. Group 1 had been the only group of teachers to significantly increase their praising of students, but this did not translate from their trainer's praising.

For questioning behavior the group percentages were: Group 1 - 8.0%; Group 2 - 3.6%; Group 3 - 4.1%; Group 4 - 4.8% and Group 5 - 3.6%. The interesting point to note here is that Group 1 teachers were the only ones who did not decrease significantly the variables of Teacher Asks Direct Questions and Students Respond. The Group 1 trainer had been the trainer to use the most questions.

The Stallings model for training is designed for small groups where teachers are encouraged to bring their experiences to the group for suggested solutions. This is a situation similar to Flanders' indirect instruction. If the teachers transferred to their classrooms their experiences from training, those groups with a greater proportion of indirect instruction would be expected to have more praising and supporting and positive interactions than the teachers in groups with direct training approaches. An examination of table 12 supports this relationship. The Group 1 trainer had the most indirect approach, and her teachers were the ones who had increased their praising and supporting of students. The link between indirect training and teacher-student positive interactions would also hold for Group 1, but fails for Group 3 which also had positive interactions, but the most direct trainer style.

It could be postulated that trainers who do not dominate the discussions would be most likely to induce their teachers to want to change their classroom interactions. This appears to be supported by the low percentage of trainer talk (31.7%) in Group 5, which had the highest ranking of teacher

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table 12

GROUP SUMMARIES OF THE FLANDERS CHARTS

	Group 1	Group 2	Group 3	Group 4	Group 5
% Indirect Training	25.9%*	13.3%	12.2%°	16.0%	15.2%
% Direct Training	74.1	86.7	87.8	84.0	84.8
% Trainer Talk	44.5	64.0*	51.3	51.6	31.7°
% Teacher Talk	49.7	28.0	34.7	41.2	55.4
% No Talk/All Talk	5.7	8.0	14.0	7.2	12.9
% Interaction	26.9	29.0*	20.7°	21.7	21.3
% Identical Pairs	73.1	71.0	79.3	78.3	78.7

*Group with the greatest percentage.
°Group with the least percentage.

change. However, the importance of teacher talk vs. trainer talk is not supported by the remaining groups in which Group 2, ranked second, has the highest proportion of trainer talk, and Group 4, ranked last, falls in the middle of the proportions.

It may be that teachers from training groups with more interaction modified their classroom behaviors to have more teacher questioning and student responding interactions. This would be best represented by Group 1 which did not decrease interactions on these variables. Table 12 indicates, however, that no such relationship can be established.

Group 5, which had the highest ranking is different from the other groups in the Flanders analysis in the categories, Accepts Feelings, and Accepts or Uses Student Ideas, in which Group 5 has the lowest percentage. A possible explanation is that the trainer did not want to accept or reinforce teachers' current behaviors; instead she wanted to encourage them to adopt the behaviors taught by the program.

Group 2, in which the teachers made significant change in the Snapshot variables, presents a model distinguished in three ways: Group 2 had the

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greatest amount of trainer talk -- two-thirds of the statements. In addition this group had the greatest number of interactions and praise.

The Flanders analysis appears to be very useful for trainers to examine their own individual styles of training. It is not as strong in establishing that the dimensions that it measures are critical in effecting teacher change. As a measurement tool, it identified an outstanding group on a few items, but could not discriminate among the remaining groups.

The adaptation of the classroom observation technique to an observation of taped teacher training was not difficult. There was a feeling of inappropriateness of separating categories 8 and 9 (Predicted Response and Unsolicited Response). In most situations the teachers were asked to give descriptions of their classroom situations which could be in either category.

The other major question of misfit was the emphasis on interaction. The Flanders analysis was designed for the quick—teacher asks question then student responds—exchanges of the classroom. For adults, each speaker, whether trainer or teacher usually talks for a prolonged period. That is why so many of the tallies on the charts fall in cells (5-5) and (9-9). The tallies in the other cells do, however, shed valuable information about the trainer's style and would suggest that this observation system is valuable, but that different expectations and analyses of the data should be made for teachers in training as opposed to students in a classroom.

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B. O. SMITH'S ANALYSIS OF THE LOGIC OF TEACHING

In the 1950's B. O. Smith studied classroom discourse by using tape recordings. Transcripts of the tapes formed the basis for identifying episodes or completed verbal transactions between two or more speakers. As Smith describes it, "We can sense a forward surge in the flow of talk, propelled by the familiar rising tones of a question or declaration. A spate of responding talk is thus launched, runs on, then tapers off." (Smith, p. 3.3) Within this description it can be seen that an episode has three parts: an opening phase, a sustaining phase, and a terminating phase. Smith concentrated on the entry statement which initiated the opening phase of an episode. The entry, "always contains a verbal move which evokes at least one, but more often a series of related verbal exchanges. It is always a self-initiating move on the part of the person who makes it and is followed by responding remarks." (Smith, pp. 5.1-5.2)

The entry is usually a question and thus can be analyzed for the type of logic or symbolic operations being required of students, or in this case, of teachers in training. The category of logic of the entry was determined by the type of response it demanded. Smith used an empirical procedure for defining the categories based upon the nature of the entries themselves.

The categories which fit the empirical approach and which were still common in discourse on logic were: Definition, Designation, Classification, Conditional Inference and Substituting. Other categories -- Explanation, Evaluation, and Compare/Contrast -- though not established in studies of logic, demand specific forms of logical thinking. The remaining categories, Describing, Stating and Reporting, were further categories required by the empirical approach of the study in order to classify all entries, as was the category of instructor directions, Directing and Managing Statements.

These categories can provide insights to the type of thought and analyses teachers were being asked to make of their teaching situations. Certain questions or entries require teachers to more deeply examine their teaching behaviors, and thus might be more likely to alter those behaviors.

The procedures used basically followed those recommended by Smith; however, a transcript was not prepared because of time and cost considerations, and because it appeared to be necessary only to write the entry phrases of the trainers. The entry phrases proved to be the major problem in adapting the classroom model to a teacher training situation: In teacher training, many of the episodes were initiated by the teachers, and the trainer would speak only during the terminating phase of the episode. The decision was made to only code the trainer's entry statements. As a result, the teacher-initiated episodes were not used. The major point to be made is that teachers initiated much of their own training, which is not as true of students in a classroom.

Five observers each listened to one workshop of each of the five trainers. The observers wrote down each entry question or statement of the trainers. One rule required that a statement could be counted as an entry only if it asked for and received a response from teachers. After the entries were typed, they were color-coded by workshop and by trainer, and cut out to have only one entry on each slip of paper. The approximately 700 slips, lying in one pile, were alternately divided into two sets. Four observers formed two teams, and each team analyzed all of the entries in one of the sets and placed them in the appropriate category as shown in chart 6.

Using the number of entries by category, except Substituting, and by trainer, ($n = 61$), the correlation between teams was $r = .82$. For Substituting there were no tallies. Even with the high correlation, there was a problem in the Stating category for which one team had assigned 102 entries compared

chart 6

CATEGORIES OF LOGIC

Categories of B. O. Smith*	Working Definitions Used with Categories
I. DEFINING - provide the meaning of a term. Concern is with how words or other symbols refer to objects.	I. deals with definitions.
II. DESCRIBING - tell about something or represent it by words.	II. answers are to be yes or no, or a specific answer, without any explanation.
III. DESIGNATING - identify something by name. Something is described and the name used to refer to it is asked for.	III. given the category, identify the items that fall in that category.
IV. STATING - state something; simply naming or describing is seldom satisfactory.	IV. answers must give an explanation; may answer a "what" question, may begin with yes or no.
V. REPORTING - report on a document, or give a summary or review	V. summarizing
VI. SUBSTITUTING - perform a symbolic operation, usually of a mathematical nature.	VI. mathematical operations
VII. VALUATING - estimate the worth, dependability, desirability of something.	VII. render a judgement or evaluation that is professionally based.
VIII. OPINING - express a belief, usually based on little or no evidence.	VIII. give an opinion; answers questions like "What do you think?" "How do you feel about ...?"
IX. CLASSIFYING - place a given instance into the class (type, sort, group, set, kind) to which it belongs.	IX. classify; given an item, identify the category to which it belongs.
X. COMPARING AND CONTRASTING - compare two things noting their similarities and differences.	X. compare or contrast
XI. CONDITIONAL INFERRING - provide a consequent, given an antecedent or condition in the entry statement.	XI. use inferential thinking; entries contain an antecedent, may use the word, "if."
XII. EXPLAINING - explain a particular event or give an antecedent, when a particular consequent is provided.	XII. responds to a "how" or "why" question; gives an explanation as to why something occurred. More explanatory than STATING.
XIII. DIRECTING AND MANAGING CLASSROOM - trainer statements designed to keep the class activities moving.	XIII. gives instructions of what to do.
	XIV. DEFAULT - legitimate or illegitimate entries which are ambiguous.

*Smith, pp. 5.1 to 5.18

to the other team's 50. Because distinction among levels of trainers' entries was of greater importance and because an effect of rater bias would be lessened, the team with the fewer number assigned to Stating (meaning that finer distinctions were made) reanalyzed the 102 entries. This then created an imbalance in the Describing category which were then also re-analyzed by the one team. After the reanalyses, the two groups were still correlated with r = .81. Major findings of this process were that (1) teams need to know more clearly to what degree their decisions are to be linguistically based, and (2) there is a team/rater with trainer interaction.

As Smith found, the team decisions were often based on linguistic clues; that is, the use of words such as "how" or "why" often provided the first indication of which category was appropriate for an entry. The categories as defined by Smith were supplemented with verbal clues and working definitions by the teams on this research (chart 6).

The most frequent categories of trainer entries were Describing, Stating and Explaining, and this was consistent across groups. (See table 13.) Group 1 strongly distinguished itself from the other groups by the large proportion of opining entries, coupled with the low valuating proportion. This may explain why Group 1 teachers did not lose or decrease their frequencies on any of the observed positive variables: The effect of the trainer's constantly asking the teachers' opinions in fact reinforced their current behaviors. Group 1 had the largest total of entry statements, which is reinforced by the Flanders' total number of questions, (chart 1, row 4).

Group 2 had the fewest total entry statements, indicating that the instructor did not initiate as many episodes or talked more in monologue. Refering to Flanders' finding (chart 2, cell 5-5) indicates that the Group 2 trainer did use a lot of monologue, more than the other trainers. In the Flanders findings, this trainer had the greatest percentage of trainer talk and the greatest number of interactions. This trainer used Smith's

table 13

CATEGORIES OF LOGIC OF TRAINERS' ENTRY STATEMENTS

Categories	Group 1 #	Group 1 %	Group 2 #	Group 2 %	Group 3 #	Group 3 %	Group 4 #	Group 4 %	Group 5 #	Group 5 %	Average %
I. DEFINING	5	2.9%	7	7.0%	6	4.3%	5	4.5%	1	0.6%	3.9%
II. DESCRIBING	37	21.6	44	44.0	40	28.4	32	28.6	53	33.8	31.3
III. DESIGNATING	10	5.8	8	8.0	8	5.7	19	17.0	14	8.9	9.1
IV. STATING	32	18.7	11	11.0	25	17.7	12	10.7	26	16.6	14.9
V. REPORTING	3	1.8	0	0.0	1	0.7	0	0.0	1	0.6	0.6
VI. SUBSTITUTING	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
VII. VALUATING	5	2.9	4	4.0	8	5.7	9	8.0	9	5.9	5.3
VIII. OPINING	35	20.5	3	3.0	15	10.6	7	6.3	18	11.5	10.4
IX. CLASSIFYING	2	1.2	0	0.0	6	4.3	2	1.8	3	1.9	1.8
X. COMPARE/ CONTRAST	2	1.2	1	1.0	2	1.4	0	0.0	2	1.3	1.0
XI. CONDITIONAL INFERRING	4	2.3	5	5.0	1	0.7	1	0.9	3	1.9	2.2
XII. EXPLAINING	18	10.5	10	10.0	16	11.3	16	14.3	17	10.8	11.4
XIII. DIRECTING AND MANAGING STATEMENTS	18	10.5	7	7.0	13	9.2	9	8.0	10	6.4	8.2
DEFAULT/NOT ASSIGNABLE	(6)		(3)		(6)		(0)		(4)		
Total:	171		100		141		112		157		

Describing category more than the other trainers and used Opining the least. This trainer apparently wanted short answers based on the content being learned, without any loss of time discussing individual opinions.

Group 3 had the largest proportion of classifying entries; although this was still small. In this situation, teachers are asked to identify the general category into which one or more examples belong. Group 4 had the largest proportion of designating entries, asking teachers to give examples of a situation, or items in a set. Group 4 also asked the largest proportions of valuating questions, asking teachers to judge situations. Group 5, as in the other analyses, is neither highest or lowest in any category -- excepting being lowest in Directing and Managing Statements.

The expectation that asking teachers to think more carefully about their own experiences would make them more likely to alter their teaching, proved not to be true. An indication of the opposite -- that to make teachers change, the trainers should rely more on Describing entries asking teachers to give short, specific answers -- was indicated.

The analysis of the logic of the trainers' entry statements provides an insight into what the trainer expected of the teachers, both in response mode and in mental processing. This in turn provided partial explanations for the intervening processes leading the the teachers' changing their classroom behaviors.

CONTENT ANALYSIS

An analysis of content could provide the most useful data for a study of this kind. It would show what was really taught in the training groups, and it would show which content areas were stressed by those trainers who proved to be more effective in causing their teachers to change. The corollary to that is that the analysis of content would show which content areas of training were the most useful parts of training.

The form which catalogues the content areas to be tallied (see table 14) was developed empirically based upon the consultant's training of teachers. Recall that each Monday the trainer worked with the teachers in a workshop while the other trainers observed. The next day, those trainers worked with their own workshop teachers and covered the same material as the consultant. The consultant's workshop was determined to be the best source of categories since workshop exchanges often go beyond printed curriculum materials. Thus the catalogue for the first workshop was based upon the first Monday workshop of the training program. The catalogue for the second workshop was again based upon the consultant's second workshop, using the initial form and supplementing it with additional items as they were introduced in training. The catalogue for each workshop was developed in this way, building upon the items given for prior workshops.

The five observers used the forms to analyze the training tapes in sequence, so each trainer's workshop was analyzed within the same catalogue restrictions. Observers added additional items to the form when the content did not conform to the given catalogue items. The observers tallied each of the trainer's clauses or sentences under the appropriate item.

The observers were not formally trained, but they were made familiar with the catalogue items. They reported no difficulties in knowing where

table 14

TRAINER REFERENCE TO CONTENT CATEGORIES

freq. = the number of clauses or sentences said by the trainer which fall in the given category.

p. = this category's proportion of all the trainer's statements.

rank = the rank among trainers in the proportion of statements in this category.

	Grp 1	Grp 2	Grp 3	Grp 4	Grp 5		A. THE WORKSHOP EXPERIENCE
freq.	100	116	35	155	265	A.1	Background in teacher effectiveness
p.	.04	.03	.02	.06	.11		research; general findings about edu-
rank	3	4	5	2	1		cation, student behavior; this training.
freq.	185	112	171	114	152	A.2	Trainer personal reactions and obser-
p.	.07	.03	.08	.05	.06		vations; "I" statements; discussion of
rank	2	5	1	4	3		today's workshop.
freq.	88	83	60	89	68	A.3	Instructions of what to do next in the
p.	.04	.02	.03	.04	.03		workshop.
rank	1.5	5	3.5	1.5	3.5		
freq.	448	276	139	331	306	A.4	Setting the workshop climate; stroking;
p.	.18	.08	.06	.13	.13		asking teachers, "What are you doing?";
rank	1	4	5	2.5	2.5		calling on teachers.
freq.	146	206	43	59	73	A.5	Review of prior workshops; report on
p.	.06	.06	.02	.02	.03		homework and other assignments; overview
rank	1.5	1.5	4.5	4.5	3		of future workshops.
freq.	197	236	169	91	166	A.6	Statement intended to alter teachers'
p.	.08	.07	.08	.04	.07		behavior; homework; what to do in their
rank	1.5	3.5	1.5	5	3.5		class that week; training other teachers.
freq.	146	117	252	215	172	A.7	Observation forms: Snapshot, Five Minute
p.	.06	.03	.12	.09	.07		Interaction (FMI), observation process
rank	4	5	1	2	3		itself.
freq.	112	222	111	172	115	A.8	Profiles; how to interpret profiles;
p.	.05	.06	.05	.07	.05		teacher's individual profile.
rank	4	2	4	1	4		
freq.	123	91	55	165	144	A.9	Workshop packets and materials.
p.	.05	.03	.03	.07	.06		
rank	3	4.5	4.5	1	2		
freq.	17	54	16	6	45	A.10	Doesn't conform to content mode: chatting,
p.	.01	.02	.01	*	.02		pleasant exchanges, jokes, etc.
rank	3.5	1.5	3.5	5	1.5		
freq.	36	37	49	29	24	A.11	Can't hear, discern.
p.	.01	.01	.02	.01	.01		
rank	3.5	3.5	1	3.5	3.5		
total	1598	1550	1100	1426	1530		
p.	.64	.44	.50	.57	.65		
rank	1.5	5	4	3	1.5		

- continued -

*proportion is less than .01.

table 14 continued

TRAINER REFERENCE TO CONTENT CATEGORIES:

	Grp 1	Grp 2	Grp 3	Grp 4	Grp 5	B. STRATEGIES FOR TEACHING READING
freq.	13	31	4	6	11	B.1 Clarity; give clear instructions.
p.	.01	.01	*	*	*	
rank	1.5	1.5	-	-	-	
freq.	5	52	5	0	22	B.2 Variety; use a variety of materials,
p.	*	.01	*	*	.01	activities.
rank	-	1.5	-	-	1.5	
freq.	66	24	30	57	32	B.3 Individual differences; assess student
p.	.03	.01	.01	.02	.01	levels; use different techniques with
rank	1	4	4	2	4	different student ability levels.
freq.	12	81	29	4	10	B.4 Personalize instruction; make instruction
p.	*	.02	.01	*	*	appropriate to each child; individualize
rank	-	1	2	-	-	within groups.
freq.	18	90	25	10	42	B.5 Whole group instruction, small group
p.	.01	.03	.01	*	.02	instruction are recommended, not indi-
rank	3.5	1	3.5	-	2	vidualized instruction.
freq.	9	8	4	29	26	B.6 Short quizzes, test taking, are recom-
p.	*	*	*	.01	.01	mended.
rank	-	-	-	1.5	1.5	
freq.	9	2	5	9	8	B.7 Practice drill; oral drill are recommended.
p.	*	*	*	*	*	
rank	-	-	-	-	-	
freq.	5	12	3	12	16	B.8 Discussion; review; students presenting
p.	*	*	*	*	.01	material.
rank	-	-	-	-	1	
freq.	24	15	15	0	0	B.9 Reading; focus on teaching reading.
p.	.01	*	.01	*	*	
rank	1.5	-	1.5	-	-	
freq.	37	46	42	37	39	B.10 Reading aloud; students and teacher
p.	.01	.01	.02	.01	.02	reading aloud, not silent reading are
rank	4	4	1.5	4	1.5	recommended.
freq.	4	5	7	0	1	B.11 Vocabulary; teaching vocabulary.
p.	*	*	*	*	*	
rank	-	-	-	-	-	
freq.	84	46	6	118	15	B.12 Teaching reading in content areas -
p.	.03	.01	*	.05	.01	science, mathematics, etc.
rank	2	3.5	5	1	3.5	
freq.	8	37	0	95	6	B.13 Teaching students to follow directions,
p.	*	.01	*	.04	*	use books, charts, graphs.
rank	-	2	-	1	-	
freq.	11	24	30	3	2	B.14 Readability formulas: CLOZE test, sight
p.	*	.01	.01	*	*	vocabulary test.
rank	-	1.5	1.5	-	-	
total	305	468	205	380	230	
p.	.12	.13	.09	.15	.09	
rank	3	2	4.5	1	4.5	

- continued -

table 14 continued

TRAINER REFERENCE TO CONTENT CATEGORIES.

	Grp 1	Grp 2	Grp 3	Grp 4	Grp 5		
						C. [illegible]M MANAGEMENT	
freq.	89	178	63	49	101	C.1	Org[illegible]tion; be organized and reduce
p.	.04	.05	.03	.02	.04		class[illegible]m management time; planning;
rank	2.5	1	4	5	2.5		record [illegible]eeping; distributing materials.
freq.	27	76	43	14	36	C.2	Use of time; allocation of time to each
p.	.01	.02	.02	.01	.02		activity; get on task; avoid off-task
rank	4.5	2	2	4.5	2		behavior.
freq.	9	12	28	8	12	C.3	Task involvement; "Time on Task."
p.	*	*	.01	*	.01		
rank	-	-	1.5	-	1.5		
freq.	13	3	1	12	38	C.4	Academi[illegible]: Learning Time (A.L.T.): students
p.	.01	*	*	*	.02		are "engaged" or on task and working at
rank	2	-	-	-	1		an 80% success rate.
freq.	9	4	88	64	11	C.5	Forming groups and organizing group
p.	*	*	.04	.03	*		activities.
rank	-	-	1	2	-		
freq.	26	5	17	13	31	C.6	Intrusions, try to reduce them; intercom.
p.	.01	*	.01	.01	.01		
rank	2.5	5	2.5	2.5	2.5		
total	173	278	240	160	229		
p.	.07	.08	.11	.06	.10		
rank	4	3	1	5	2		
						D. BEHAVIOR MANAGEMENT	
freq.	7	97	4	18	23	D.1	Student involvement; causing more student
p.	*	.03	*	.01	.01		responding; calling on all the students;
rank	-	1	-	2.5	2.5		oral responses.
freq.	45	120	65	78	16	D.2	Praising and supporting.
p.	.02	.03	.03	.03	.01		
rank	4	2	2	2	5		
freq.	12	27	12	1	17	D.3	Positive interactions; interactions,
p.	*	.01	.01	*	.01		smiling.
rank	-	2	2	-	2		
freq.	9	17	11	139	34	D.4	Motivating behavior; making students feel
p.	*	*	.01	.06	.01		interested, successful; avoiding negative
rank	-	-	2.5	1	2.5		statements; clarifying values.
freq.	27	10	4	26	15	D.5	Socializing and social statemements are
p.	.01	*	*	.01	.01		to be avoided by the teacher.
rank	2	-	-	2	2		
freq.	44	213	317	31	39	D.6	Behavior Management; disciplining; be-
p.	.02	.06	.15	.01	.02		havior statements.
rank	3.5	2	1	5	3.5		
total	144	484	413	293	144		
p.	.06	.14	.19	.12	.06		
rank	4.5	2	1	3	4.5		

- continued -

table 14 continued

TRAINER REFERENCE TO CONTENT CATEGORIES:

	Grp 1	Grp 2	Grp 3	Grp 4	Grp 5	E. FEEDBACK AND DIRECT INSTRUCTION
freq.	1	8	0	1	16	E.1 Enthusiasm; be enthusiastic, excited,
p.	*	*	*	*	.01	involved.
rank	-	-	-	-	1	
freq.	0	38	6	19	16	E.2 Questioning; use a variety of questions;
p.	*	.01	*	.01	.01	how to ask questions.
rank	-	2	-	2	2	
freq.	20	17	26	26	8	E.3 Direct questions are recommended.
p.	.01	*	.01	.01	*	
rank	2	-	2	2	-	
freq.	14	57	51	16	44	E.4 Clarifying questions are recommended.
p.	.01	.02	.02	.01	.02	
rank	4.5	2	2	4.5	2	
freq.	56	110	18	37	52	E.5 Interactive instruction is recommended,
p.	.02	.03	.01	.01	.02	not teacher working alone.
rank	2.5	1	4.5	4.5	2.5	
freq.	33	173	31	24	50	E.6 Instruction and explanation; direct in-
p.	.01	.05	.01	.01	.02	struction; academic and content focus.
rank	4	1	4	4	2	
freq.	61	61	25	36	18	E.7 Giving feedback is recommended.
p.	.02	.02	.01	.01	.01	
rank	4.5	4.5	2	2	2	
freq.	21	121	10	11	1	E.8 Making assignments and giving homework.
p.	.01	.03	*	*	*	
rank	2	1	-	-	-	
freq.	26	107	40	38	15	E.9 Correcting and guiding; correction; telling
p.	.01	.03	.02	.02	.01	the student that he or she is wrong.
rank	4.5	1	2.5	2.5	4.5	
freq.	20	4	10	6	10	E.10 Written assignments in class are not
p.	.01	*	*	*	*	recommended.
rank	1	-	-	-	-	
freq.	6	36	10	24	8	E.11 Monitoring written work is not recom-
p.	*	.01	*	.01	*	mended.
rank	-	1.5	-	1.5	-	
total	258	732	227	238	238	
p.	.10	.21	.10	.10	.10	
rank	3.5	1	3.5	3.5	3.5	

to mark the tallies of the analysis. Each observer listened to only one workshop of any one trainer, thus observer bias is evenly distributed across trainers.

Similar to the findings in the citation analysis, items which changed for each group of teachers, shown in table 4, when compared to discussion of the same item in the content analysis bore no noticeable relationship. The only exception to this was Group 2. In this group, the classroom FMI variable, Intrusion, increased, which was not supposed to happen. In the content analysis, Group 2 ranked last in discussing intrusions and how to cope with them. Among the Snapshot variables of table 4, Group 2 teachers made significant change in two of the variables, and the Group 2 trainer also ranked highest in discussing these items, which were Making Assignments and Student Uninvolved.

A broader view of the items in the content analysis compared to the overall ranks of the groups provides some useful information. Recall that the group ranks are Group 1 - rank 4; Group 2 - rank 2 ; Group 3 - rank 3; Group 4 - rank 5, and Group 5 - rank 1.

Among the Workshop Experience categories, several points are worth noting. Item A.4, which calls on teachers to relate their experiences and includes stroking, is apparently not a recommended trainer behavior because the two top local trainers, Groups 2 and 3, were the lowest ranked. For another item, A.6 in which trainers give homework or try to change teacher behavior, Group 4 had the lowest proportion, about half of the other trainers. This may provide a clue as to why Group 4, which is similar to the other training groups on other measures, resulted in the least teacher change: The trainer may not have tried as hard to change the teachers' behavior. And item A.10, the category of general frivolity and gaiety, ranked Groups 2 and 5 the highest. If there is a relationship

between having fun and changing behavior, it could represent an acceptance of one another, a camaraderie, or a recognizing of the difficulties facing teachers without being overwhelmed by them. In the total of the Workshop Experience categories, Groups 2 and 3 spent the least proportion of statements; apparently, they put their emphasis on the content of training, not on the communication processes and structure of the workshop.

Among the Strategies for Teaching Reading, Groups 2 and 3 ranked the highest on B.4 personalizing instruction and B.14 readability formulas, Groups 3 and 5 on B.10 reading aloud, and Groups 2 and 5 on B.2 using a variety of materials and B.5 group instruction. The important observation about B.5 is that it also placed Group 4 in the bottom rank. This is probably one variable which is key for teachers who will be measured by the SRI Secondary Observation Instrument.

Two items appear to fall in the "what not to do" column. On these, the three top ranked groups were the lowest in discussing this material in their workshops. The items were B.3 assessing and teaching to student ability levels, and B.12 teaching reading in the content areas. Group 4 spent a lot of time discussing B.12, but the emphasis didn't appear to encourage teachers to change the ways they were teaching. Examining the totals for this area, it doesn't seem that emphasis on Strategies for Teaching Reading is that useful in changing teachers' behaviors.

The area of Classroom Management is different. Here the rankings on the categories closely match the group ranks of teacher changes. Specifically, the items which rank Groups 2, 3 and 5 the highest and Group 4 the lowest are C.1 organization, C.2 careful use of time, and C.3 time on task. C.6 intrusions has been noted earlier for Group 2.

In the general and specific category of Behavior Management (D.6) Groups 2 and 3 take a leading role. The emphasis and concentrated discussion on how to deal with behavior and discipline problems may have proven to be very useful to the teachers. The study of trainer citation found a similar relationship for the variable, All Behavior Statements. The other important category in this area is D.3 positive interactions, which singled out the three top groups.

The findings under the area, Feedback and Direct Instruction, are generally ambiguous; although judging by the total, Group 2 chose to put a much greater emphasis here, and Group 2 is the only one to significantly change the structure of the classroom situation as illustrated in the Snapshot. Group 2 ranked first on E.2 questioning, E.4 using clarifying questions, E.5 using interactive instruction, E.8 making assignments, E.9 correcting and guiding, and E.11 avoiding monitoring. The one item which identified the three top groups was E.4 emphasis on using clarifying questions.

In the methods employed in this content analysis, a comparison of ranks, simple probability would indicate that the ranking of some of the items would correspond to any given ranking of the groups. However, there was a pattern to the items which matched the ranks, and there was some logic to why those items fell as they did. A replication of this analysis with a similar training program would be a valuable validation of the findings reported here. This analysis should be most useful to those who plan training groups and to trainers of teachers by identifying which areas should be stressed and which deemphasized.

CONCLUSION

Observers as they listened to the workshop tapes made personal comments about other characteristics they had noted about the different training styles. In retrospect, some of these comments could provide valuable clues to the true dimensions separating the truly effective training approaches from those which are not as effective. What this indicates in terms of this study is that a fifth analysis was needed, that of the observer participant - the person who just listens and makes notes about what he or she hears and how that might serve to encourage teachers to change.

Some of the observers' comments and other information about these training groups might be useful in presenting a more complete picture of each trainer and her set of teachers. Another note in passing is that all the trainers received very high ratings from the teachers on all the workshop feedback forms, and this strong positive feeling about the training persisted and was reported again in an evaluation a year later.

Group 1 had only three teachers, which may have altered the trainer's role since she was among friends. More significantly, however, was the fact that one of her teachers had a class of academically advanced students, thus many of the variables of training were not appropriate for change, and some workshop discussion had to be devoted to discussing the exceptions to the rules. One observer commented that Group 1 seemed to do a lot of reinforcing of what the teachers were already doing and what they thought. The B. O. Smith analysis picked this up in the Opining category.

Group 2, as noted by two observers, had a lot of joking and laughing. This was also found by the Content Analysis. This trainer made one important statement from the perspective of changing teacher attitudes and behavior: In discussing the criterion as a goal for teachers on one variable she said, "The criterion is 50, but you are all so good, that we are going to try for 70."

In Group 3 during the workshop in which teachers reported on their experiences trying to improve two variables in their classrooms, this trainer devoted a large amount of time to these reports -- what the teachers had tried and how it had worked. The message of this emphasis was that the teachers were expected to try to change, and that they would be held accountable to the group for what they tried.

The Group 4 trainer was described by one observer as a counselor type who used a lot of stroking. On many of the measures of this study Group 4 fell in the middle of the ranges, yet these teachers changed the least. The clue may be in some of the comments early in training. The trainer asked teachers to introduce themselves and in so doing to state what they "would be able to contribute to the training." This is a good technique for causing people to support a program but not for inducing them to change. At another point the trainer reminded them that they were "the cream of the crop." Again, it's reinforcing, but may not encourage them to change. The clue may be something more direct, however -- just a simple mistake in bringing about attitude and behavioral change: During the workshop in which the teachers were to select two variables to work on that week, the trainer did not require that they state publicly which variables those would be. A public commitment to change is an important incentive to cause people to change. In terms of available time in a time-on-task model, Group 4

was the shortest. One workshop was cut short by bad weather, and when another workshop had to be made up, it took place in a school in which the intercom boomed every ten minutes (so it seemed), and recess seemed to take place in the same room with the tape recorder. The conditions were not conducive to good training and the workshop was cut short.

Group 5 was trained by the consultant; eleven teachers participated while the four other trainers, who were also supervisors to these teachers, observed from the back. One observer commented that this trainer seemed to be "straight out of Flanders," which might be valid if based on the high percentage of teacher talk in this training. The consultant had her comments most strongly grounded in the research, as verified by the Content Analysis, and she also strongly encouraged the teachers to change. In the final workshop she kept reminding the teachers that after the post observations, there would be a follow-up meeting at which time she could see how well they had all done. They responded since as a group they changed on the post observations the most.

In assessing the relative contributions of the four methods of observation used in this study, some of the basic assumptions underlying the ranking of the groups come into question. The magnitude of change based upon an analysis of covariance was used. The problems of covariance were generally controlled by the use of rank equivalents. No reference was made to whether some variables might be more significant than others.

This method took no recognition of the variables which significantly changed within each training group and no recognition that Group 2 was the only group to change the Snapshot variables. An assertion of this

paper, as yet unverified, is that the change in the Snapshot variables indicates that the teachers have restructured their classrooms and have allotted different proportions of time to activities.

An examination of results of the four analyses for Group 5, which ranked highest in teacher change, shows that Group 5 remained undistinguished except in having the greatest proportion of teacher talk. This group fell in the middle of the pack on many of the measures. This trainer was the consultant, the model for other trainers. It would be interesting to discover if the master trainer in fact usually models the typical behavior of training rather than an extreme behavior. Perhaps the magnitude of teacher change was due to the effects of the prestige of the consultant herself, not due to her methods, style or content of training.

If it is accepted that the change in the teachers in Group 5 was due to the training methods of the consultant, then these four methods of analysis (except Flanders on percentage of teacher talk) were not able to distinguish those effective training techniques. On the other hand, if it is accepted that something beyond the scope of these methods caused the teacher change, namely the effect of the consultant's prestige, then the four methods can present a strong picture of the most effective training model for teacher change.

This picture of an effective training model, specifically Group 2, must be coupled with the assumption that the Snapshot variables were measuring the true order of change. The model for effective training which emerges and is partially verified by having characteristics similar to Group 3 but dissimilar to Group 4 is: From Flanders, a trainer who does most of the talking, has frequent exchanges with the teachers and uses a lot of praise; from the Trainer Citation, a trainer who stresses

the content of training by making frequent reference to the variables on which the teachers will be observed; from the B. O. Smith Analysis, a trainer who wants short answers focused on the discussion without much elaborating or giving opinions, and from the Content Analysis, a trainer who de-emphasizes Workshop Experience categories, but stresses certain categories within Strategies for Teaching Reading, Behavior Management, Classroom Management and especially Feedback and Direct Instruction. The trainer also laughs a lot.

The different observation methods each made a contribution to understanding the most effective model for teacher training. The most accurate predictor of resulting teacher change was the total number of Trainer Citations of the Observation Variables, but the framework for the model, the structure of the trainer's interactions, relied upon the Flanders matrix. B. O. Smith's analysis gave a glimpse into the processes that take place between the trainer and teachers and how a teacher is induced to change, and finally, the Content Analysis identified those areas of training which appear to be most useful to teachers to enable them to change their teaching behaviors. Each analysis made its own distinct, yet complementary contribution to developing a model for effective teacher training.

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DOES TIME-ON-TASK WORK

FOR TEACHER TRAINING TOO?

Abstract

This study compared the results of four different methods of observing teacher training. In addition, it used the results to identify those training techniques which seemed to be better at changing teachers' behaviors in their classrooms.

Twenty-nine teachers in the District of Columbia Public Schools were trained by five trainers in five weekly training sessions, which were tape recorded. The recordings were analyzed using these observation methods: 1) Trainer Citation of Observation Variables, 2) Flanders Interaction Analysis, 3) B. O. Smith's Analysis of the Logic of Teaching, and 4) Content Analysis. The dependent variable was based upon pre- and post training observations of the teachers in their own classrooms.

The study found that among the local trainers, the one who dominated discussion, used frequent interactions, praise and laughter, and maintained an academic focus was the most effective. The findings of the four observation methods, while consistent, revealed different facets of the training experience.